Analyzing Biological Data
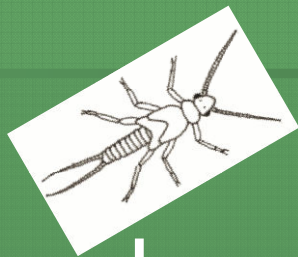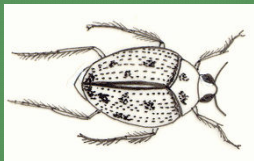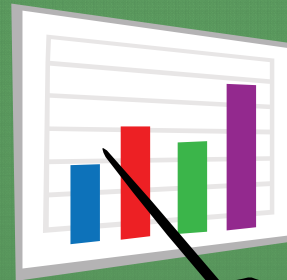
Index of Biotic Integrity (IBI)

- Definition: A mathematical equation that combines individual measurements, or metrics, to obtain an estimate of stream health.

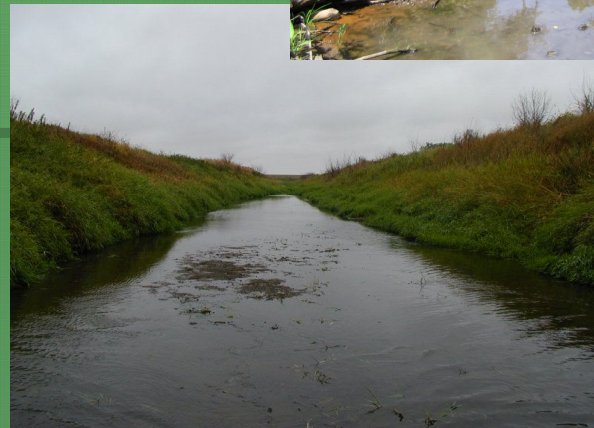- Commonly used in professional biological monitoring.

IOWATER Benthic IBI

- Uses IOWATER tolerance groups.

- IBI = $\dfrac{(\text{\# high quality} *3)+(\text{\# middle quality} * 2)+(\text{\# low quality} *1)}{\text{Total number of Benthic Macroinvertebrates}}$

IOWATER Benthic IBI

- IBI <1.75 = poor benthic community
- IBI 1.76 – 2.25 = fair benthic community
- IBI >2.25 = good benthic community

Factors that affect the biological community - HABITAT

- Benthic Macroinvertebrates need a place to live.
- If habitat is limited, the quality of the population will be reduced.

Factors that affect the biological community - SUBSTRATE

- All silt and sand = lower quality organisms

- Rock = higher quality organisms

Factors that affect the biological community – DEPTH & VELOCITY

- Sensitive organisms prefer faster water because it keeps oxygen high.
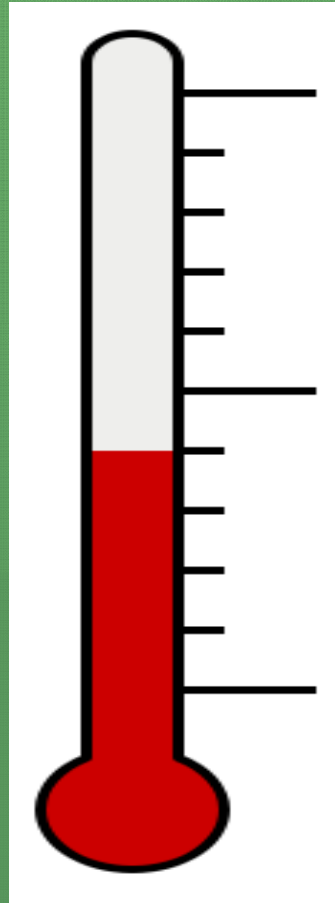- HOWEVER too high of velocity can wash away organisms.

Factors that affect the biological community - SEASON

- Many aquatic invertebrates are insect larva and emerge at different times of the year.

Factors that affect the biological community - TEMPERATURE

- Warmer water = lower dissolved oxygen
- Seasonal changes in temperature are critical to life cycles.

Factors that affect the biological community - FLOW

- Invertebrates require a fairly consistent amount of water to survive.

- Intermittent streams may not be able to support as diverse a population as perennial streams.
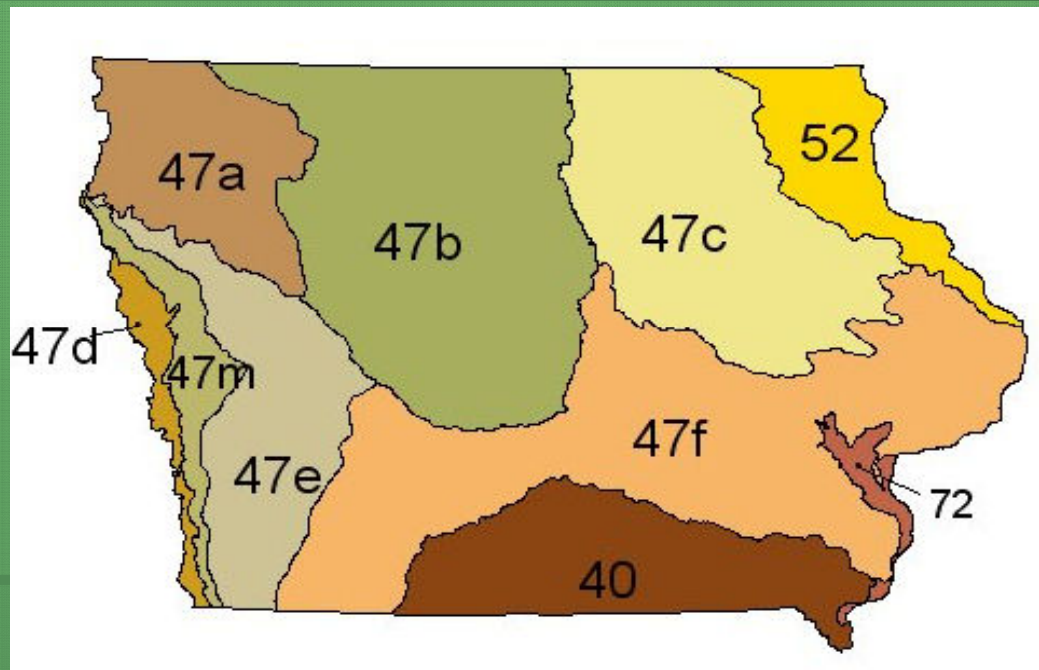
Factors that affect the biological community – WATER CHEMISTRY

- Balanced water chemistry is necessary to support diverse aquatic life.

- Invertebrates can be used as a water quality indicator.

Factors that affect the biological community - ECOREGIONS

- Biological data differ depending on where you are located in the state.